

WHAT IS CLAIMED IS:

1. A plasma processing method of processing a specimen having plural layers of films laminated on a surface thereof by using plasmas formed in a processing chamber, the specimen being placed on a specimen table, disposed in the processing chamber, the method comprising the steps of:

when a layer of a lower film is processed after an upper layer in the plural layers of films is processed, at an initial stage of the processing and a post-stage of the processing, a temperature difference of coolants, passing through each of coolant passages formed at a central portion of the specimen table and at an outer circumferential portion, is approached more to a target value, and a pressure difference of a heat conducting gas, supplied between a rear side of the specimen and the specimen table, between one at the central portion and the other at the outer circumferential portion of the specimen is adjusted to a small value.

2. A plasma processing method as defined in claim 1, wherein the temperature difference of the coolants, passing through each of coolant passages at the central portion in the specimen table and at the outer circumferential portion, is changed to be increased at the initial stage of the processing and the post-stage.

3. A plasma processing method as defined in claim 1, wherein the temperature difference of the coolants and the pressure difference of said heat conducting gas are adjusted on the basis of information obtained in advance before the processing of the specimen is started.

4. A plasma processing method of processing a specimen, placed on a specimen table disposed below and inside of a processing chamber, by using plasmas formed in said processing chamber above said specimen table, the specimen having plural layers of films laminated on a surface thereof, the method comprising the steps of:

when a layer of a lower film is processed after an upper layer in the plural layers of the films is processed, during the processing, a pressure difference of a heat conducting gas, supplied between a rear side of said specimen and the specimen table, between one at a central portion and the other at an outer circumferential portion of the specimen is adjusted to a small value while a temperature difference of coolants, passing through each of coolant passages formed at a central portion of the specimen table and at an outer circumferential portion, is being changed.

5. A plasma processing method as defined in claim 4, wherein the temperature difference of the coolants and the pressure difference of the heat conducting gas are adjusted on the basis of information obtained in advance before the processing of the specimen is started.

6. A plasma processing method of processing continuously plural specimens, placed on a specimen table disposed below and inside a processing chamber, by using plasmas, formed in the processing chamber above the specimen table, the plural specimens having plural layers of films laminated on a surface thereof, the method comprising the steps of:

when another specimen is processed after one of the plural specimen is processed, at an initial stage of the processing and a post-stage thereof, a temperature difference of coolants, passing through each of coolant passages

formed at a central portion of the specimen table and at an outer circumferential portion, is approached more to a target value, and a pressure difference of a heat conducting gas, which is supplied between a rear side of said specimen and the specimen table, between one at a central portion and the other at an outer circumferential portion of said specimen is adjusted to a small value.

7. A plasma processing method as defined in claim 6, wherein the temperature difference of the coolants, passing through each of coolant passages at the central portion in said specimen table and at the outer circumferential portion, is changed to be increased at the initial stage of the processing and the post-stage.

8. A plasma processing method as defined in claim 6, wherein the temperature difference of the coolants and the pressure difference of said heat conducting gas are adjusted on the basis of information obtained in advance before the processing for the another specimen is started.

9. A plasma processing method of processing continuously plural specimens, placed on a specimen table disposed below and inside a processing chamber, by using plasmas, formed in the processing chamber above the specimen table, the plural specimens having plural layers of films laminated on a surface thereof, the method comprising the steps of:

when another specimen is processed after one of the plural specimens is processed, during the processing, a pressure difference of a heat conducting gas, which is supplied between a rear side of the specimen and the specimen table, between one at a central portion and the other at an outer

circumferential portion of said specimen is adjusted to a small value while a temperature difference of coolants, passing through each of coolant passages formed at a central portion of the specimen table and at an outer circumferential portion, is changed.

10. A plasma processing method as defined in claim 9, wherein the temperature difference of the coolants and the pressure difference of the heat conducting gas are adjusted on the basis of information obtained in advance before the processing for the another specimen is started.